leaving is rarely saturated, but its humidity may be estimated by means of a hygrometer, the one usually adopted for this purpose being the wet and dry bulb thermometer type. If the air entering at 60° F. had a dew-point temperature 50° F., say, the vapour contents would be o 008 Ib. per pound air. To find the heat contents the line A B (fig. 29) would be drawn parallel to the straight line *a b,* giving the point B₎ the heat contents being 15 B.Th.U. The small amount of heat represented by the superheating of the vapour from 50° F. to 60° F. is neglected in this estimate. If the air at outlet had the relative humidity 80 per cent, and the temperature is 90° F., the vapour contents at outlet would be

$$0\text{-}031 \times 0\text{-}8 = 0\text{-}0248 \text{ Ib. per pound air.}$$

This is a dew-point temperature of 84° F., and the heat contents is again given by drawing the line D E parallel to *a* i, giving 40 B.Th.U. per pound air. Therefore the absorption of vapour is

$$0\text{-}0248 - 0\text{-}008 = 0\text{-}0168 \text{ Ib. per pound air,}$$

and the heat absorbed is

$$40 - 15 = 25 \text{ B.Th.U. per pound air.}$$

If the heat given up at the condenser is 950 B.Th.U. per pound steam condensed, and the water under steady conditions is cooled from 100° F. to 75° F., then the water per pound steam condensed is

$$\frac{950}{\_} = 38$$

and therefore the amount of air required per pound of steam condensed is given by

$$38 \text{ Ib.} \quad \frac{38}{i} =$$

The evaporation of water is

$$\frac{0\text{-}0168 \times 100}{(i + 0\text{-}0168)} = 1\text{-}65 \text{ per cent,}$$

and make-up supply equivalent to this would be necessary with surface condensers, or with jet condensers the fresh feed water supplied to the boilers would probably be sufficient for continuous operation under these

conditions.

Similar calculations to those given above show how much more   difficult it is to cool the water for high-vacuum conditions than it is for   low   vacua. For   high   vacua,   because   of   the   relatively   low temperature of the water